USN | | | | | | | | | |

17CT54

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Transportation Engineering

Time: 3 hrs.

Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Explain Jayakar Committee and its recommendations. **(10 Marks)**
   b. List and explain different types or modes of transport. **(10 Marks)**

OR

2 a. Explain the highway planning surveys. **(10 Marks)**
   b. The area of a certain district in India is 13400 sq km and there are 12 towns as per 1981 census. Determine the lengths of different categories of roads to be provided in this district by the year 2001. **(10 Marks)**

Module-2

3 a. Explain the various stages of the engineering survey. **(10 Marks)**
   b. What are the objectives of providing camber? Explain with neat sketches different shapes of camber indicate IRC recommended values of camber. **(10 Marks)**

OR

4 a. Calculate the safe stopping sight distance for design speed of 50 kmph for,
      (i)   Two way traffic on a two lane road.
      (ii) Two way traffic on a single plane road.
      Assume co-efficient of friction as 0.37 and reaction time of driver as 2.5 seconds. **(10 Marks)**
   b. A vertical Summit curve is formed at the intersection of two gradients +3.0 and − 5.0%. Design the length of Summit curve to provide a stopping sight distance for a design speed of 80 kmph. **(10 Marks)**

Module-3

5 a. Explain the types of rail sections with neat sketches. **(10 Marks)**
   b. Explain the methods of welding of rails. **(10 Marks)**

OR

6 a. Explain the theory of coning of wheels. **(10 Marks)**
   b. Explain wear on rails. **(10 Marks)**

Module-4

7 a. Explain the functions of sleepers and ballast. **(10 Marks)**
   b. Calculate the maximum permissible train load that can be pulled by a locomotive having four pairs of driving wheels carrying an circle load of 24 tonnes each. The train has to run at a speed of 80 kmph on a straight level track (BG). Also calculate the reduction in speed of train has to climb a gradient of 1 in 200. **(10 Marks)**

OR

8 a. If a 8° curve track diverges from a main curve of 5° in an opposite direction in the layout of a BG yard, calculate the superelevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph. **(10 Marks)**

   b. Explain the following:
- (i) Tractive effort of locomotive.
- (ii) Hauling capacity of locomotive. **(10 Marks)**

Module-5

9 a. Explain the necessity and types of turnouts. **(10 Marks)**

   b. Calculate all the necessary elements required to set out a 1 in $8\frac{1}{2}$ turnout, taking off from a straight BG track with its curve starting from the toe of the switch i.e. tangential to the gauge face of the outer main rail and passes through theoretical nose of crossing. Given heel-divergence (d) = 11.4 cm. **(10 Marks)**

OR

10 a. Explain the types of track junctions. **(10 Marks)**

   b. Write a short note on:
- (i) Buffer stops
- (ii) Turn table. **(10 Marks)**

* * * * *